

Claims

1. Automatically controlled multi-axis manipulator for a processing tool (11), with at least two, in particular, hollow component members (1, 4, 5, 6), wherein the first member (6), on which the processing tool (11) to be moved by the manipulator is arranged, can be turned relative to the second member (1, 4, 5), and with a line arrangement (20, 21) that leads to the processing tool (11) on or through the component members (1, 4, 5, 6) and is fixed on a part (13, 33) of the processing tool (11), characterized by the fact that the part (13, 33) of the processing tool (11) on which the line arrangement (20, 21) is fixed is supported in a rotatable fashion relative to the first component member (6).

2. Manipulator according to Claim 1, characterized by the fact that the part (13, 33) of the processing tool (11) on which the line arrangement (20, 21) is fixed is rotatably supported in an outer housing (12, 32) that is rigidly connected to the first component member (6).

3. Manipulator according to Claim 1 or 2, characterized by the fact that the line arrangement (20, 21) leading to processing tool (11) contains supply hoses for liquid and/or gaseous media and/or signal lines.

4. Manipulator according to one of the preceding claims, characterized by the fact that a flexible shaft for absorbing torque leads through the component members (1, 4, 5, 6) parallel to the line arrangement (20, 21) and is fixed on the rotatably supported part (13, 33) of the processing tool (11).

5. Manipulator according to one of the preceding claims, characterized by the fact that component members (4, 5, 6) which form the wrist joint (2) of a robot are provided.

6. Manipulator according to one of the preceding claims, characterized by the fact that the processing tool (11) consists of an atomizer or another application device that is moved by a spray-

painting robot, wherein the interior part (13, 33) of the processing tool (11) which is connected to the line arrangement (20, 21) is rotatably supported in the outer housing (12, 32) of the atomizer or the like which is rigidly connected to the wrist joint (2) of the robot.

7. Manipulator according to one of the preceding claims, characterized by the fact that an annular ring gap (27) or ring channel (45, 46) for a medium to be conveyed through the processing tool is formed between the outer side of the interior part (13, 33) of the processing tool (11) which is connected to the line arrangement (20, 21) and its outer housing (12, 32) that is rigidly connected to the first component member (6), wherein said ring gap or ring channel is limited by sliding seals (28, 29, 47) that are seated between the inner side of the outer housing (12, 32) and the outer side of the interior part (13, 33) and adjoin the housing (12, 32) and the interior part (13, 33).

8. Manipulator according to one of the preceding claims, characterized by the fact that a sealed rotary leadthrough (58, 47, 47', 59) is provided within the processing tool for at least one line for a medium (F, ZL, HL) to be conveyed outwardly through the processing tool, wherein the medium is conveyed through a central channel (40', 56) that extends along a central axis of the processing tool or through a ring channel (27, 45, 46, 45', 46').

9. Manipulator according to Claim 8, characterized by the fact that at least one additional rotary leadthrough is provided for at least one line (41, 41') that terminates in the processing tool.

10. Manipulator according to one of the preceding claims, characterized by the fact that the processing tool, e.g., an atomizer for coating material, is supported on a mechanical interface of the manipulator, e.g., on the end member of the wrist joint of a robot, such that it is rotatable in its entirety relative to this interface.